Worksheet 1:

Architectures and Networking

Group discussion questions

1. Give *three* types of hardware and *three* types of data or software resource that can usefully be shared. Give examples of their sharing as it occurs in distributed systems.

2. What are the differences between the *client server* and the *peer process* model? What are the typical circumstances in which these models are applied?

3. Describe and illustrate the client-server architecture of the Web. Consider accessing the Web from within an intranet, which may or may not be protected by a firewall.

4. Explain how it is possible for a sequence of packets transmitted through a WAN to arrive at their destination in an order that differs from that in which they were sent. Can this happen in a LAN? an ATM network?

5. What are the main differences in the operation of the UDP and TCP protocols? Would you use UDP, rather than TCP, communication service for the implementation of:

a) terminal emulator such as TELNET

b) file transfer protocol such as FTP

c) information browsing such as HTTP

Problem solving questions

6. Consider a national organisation that manages trade accounts for shopkeepers in a chain of shops. It has a centralised database containing product information and personnel data. The organisation intends to install a call centre to make the account and product information available on line. The call centre will be based in the headquarters' building. Initially, all customer queries will be directed through the call centre, but at a later stage it is intended to make the data available directly to end users from their home or work computers. Suggest an appropriate (one-, two- or three-tier) architecture for the system. Discuss advantages and disadvantages of your proposed solution.

7. Consider the RIP routing algorithm together with the example of routing tables for the network used in the lectures. Show the sequence of changes that would occur according to the RIP algorithm after the link labelled 3 is broken.

8. Consider a communication service in which messages may be lost or delayed and checksum apply only to headers. Describe the classes of failure exhibited by this service in *asynchronous* distributed systems and in *synchronous* distributed systems.